



Digital Health Tools for Sleep Self-Management

Working Mothers Use Case

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TITLE

Digital Health Tools for Sleep Self-Management: Working Mothers Use Case

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ABSTRACT

Ever sophisticated wearable activity trackers and mobile applications enable to assess individual's daily life patterns and factors influencing their long-term health state. Working mothers may be especially vulnerable to experience poor sleep hygiene – as they try to balance work with family obligations, suffering from chronic stress, and having poor social support and insufficient personal resources to deal with daily challenges. Poor sleep hygiene may be developing over a longer period, resulting in fatigue and exhaustion and may have destructive long-term influences on the individual's psychological and physical health, cognition, and behavior, leading to a burnout state.

We present an approach to operationalizing the major risk factors for the prevalence of poor sleep hygiene in working mothers - including physical factors (e.g., physical activity, alcohol, time to bed), psychological factors (e.g., stress, feeling 'lack of control'), social factors (e.g., family settings, social pressure for socializing) and environmental factors (e.g., light, noise, room temperature). We have thoroughly examined these factors to identify which of those can be operationalized via ICT-based tools and quantified by leveraging unobtrusive sensors, including sensors embedded in personal smartphones and wearables. Such an operationalization will enable to provide reliable assessment and prediction of risk exposure, which, in turns, will permit early recognition and preventive interventions.

To support our research claims we have conducted an explorative pilot study with six working mothers wearing BASIS PEAK activity and sleep tracker for a minimum of three months each. We have collected both their subjective views (via interviews) and the underlying smartphone and wearable device usage logs 'in situ'. The results expose, on the one hand, the low physical activity levels, late time to bed, high stress and social pressure as well as poor environmental conditions of most of the mothers. On the other hand, the results indicate a high importance of routines and predictability in the daily lives of mothers, which may enable better sleep hygiene. Additionally, a wearable device's features like interaction design, battery lifetime and fashion-ability; influence the quality of the data collected. Given the results and existing research so far, we discuss design implications for monitoring and assessment of multi-dimensional events, subjective symptoms as well as physiological and behavioral variables in the natural daily settings of the working mothers for assurance of their sleep hygiene and prevention of burnout condition in a long term.